How KHN Analyzed The Data

The Payroll-Based Journal (PBJ) raw data files and documentation are located on data.cms.gov here: https://data.cms.gov/browse?q=pbj.

For each day in each nursing home:

KHN first calculated the number of nursing hours per resident day (HPRD) by dividing the hours worked by the daily census. We included registered nurses and licensed practical nurses whose jobs were principally providing direct care. We excluded the director of nursing and other nurses whose jobs were principally administrative. Including administrators would have exaggerated the difference between best- and worst-staffed days, since a resident experiences direct care the same whether an administrator is on-site or not.

Second, we calculated the number of aide hours per resident day by dividing the hours worked by the daily census. We included certified nursing assistants (CNAs), medication aides and nurses in training.

Then, for each facility we identified the 10 days with the lowest nursing HPRDs. We averaged those 10 HPRDs to calculate our measure of the worst-staffed days. We did the same thing three times more: for the 10 highest nurse HPRDs, the 10 lowest aide HPRDs and the 10 highest aide HPRDs. (We chose to round up when calculating the 10 percent of highest- and lowest-staffed days.)

Because hours per resident day is a convoluted metric for a resident or family member, we translated staffing into a ratio of the number of staff per resident. We did this by dividing 24 by the hours per resident day. For instance, 2.4 nurse aide HPRD translates to one nurse aide for every 10 residents. We believe a staffing ratio is easier to grasp, but for a small number of facilities that reported abnormally low numbers of staffing hours, it leads to unusually large ratios, sometimes more than 200-to-1. While defying common sense, those are accurate depictions of the information facilities submitted to CMS.

These resident-to-staff ratios allow you to examine the variation in staffing within each facility, but should not be used to compare staffing among facilities. For that, we included in the data the total staffing and

RN staffing measures that Medicare publishes on its Nursing Home Compare website using its five-star system. That data came from the NHC April 2018 update, located at https://data.medicare.gov/data/nursing-home-compare.

Medicare's methodology differs from KHN's calculations of highest- and lowest- staffed days. Medicare included administrators in its tally of staff. Secondly, Medicare averaged staffing on every day of the three-month period, while KHN looked at the 10 best-staffed and 10 worst-staffed days. Finally, Medicare took into account how frail each homes' residents were to risk-adjust the data to allow fair comparisons among facilities. For these three reasons, facilities that seem to be well-staffed on their actual highest- and lowest-staffing ratios may be rated as average or below average by Medicare, and vice versa. One method is not better than the other; they simply serve different purposes.

Medicare's files excluded nursing homes with "aberrant" staffing levels. Those were defined as facilities meeting any of the following criteria for a quarter: homes had five or more days with no staffing but a non-zero census; average total nurse staffing was less than 1.5 hours per resident day or greater than 12 HPRD; or average nurse aide staffing was greater than 5.25 HPRD. https://data.cms.gov/Special-Programs-Initiatives-Long-Term-Care-Facili/PBJ-PUF-Documentation-2018-01-23/ygny-gzks

To compare staffing levels from the former data — which nursing homes self-reported for the two weeks before an inspection — to payroll-based journals, we used the provider file from CMS' Nursing Home Compare. We calculated the percentage change from total staff hours in March, which used the old method, to total staff hours in the Nursing Home Compare April file, the first to use payroll-based data. Medicare included administrators in both counts, so the comparison is fair. We did not compare the risk-adjusted HPRD numbers in both files because Medicare changed its risk-adjustment methodology when it switched over to the PBJ data. Doing so would have skewed the comparison.